

simis, 1-floris.—In Africa orientali, *v. s. in herb. Hook.*, Lower Shire Valley, Zambesi (Dr. Kirk).

A climbing plant, collected during Dr. Livingstone's explorations up the River Zambesi, having slender branches  $\frac{3}{4}$ –1 line in diam., with internodes of  $1\frac{3}{4}$ – $2\frac{1}{8}$  inches; leaves 2– $2\frac{5}{8}$  inches from the end of the basal lobes to the apex, or  $1\frac{3}{4}$ – $2\frac{3}{8}$  inches long from the basal sinus,  $1\frac{3}{4}$ – $2\frac{1}{8}$  inches broad, with a petiole  $1\frac{1}{2}$  inch long; the punctate raised dots on the upper surface of the leaves are not at all scabrid; the raceme is 5–7 inches long.

11. *Tinospora Smilacina*, Bth. Proc. Linn. Soc. v. Suppl. 52;—glabra; ramulis subcoriaceis; foliis deltoideo-ovatis, profunde cordatis, sinu subangulato, lobis basalibus intus rectis, extus rotundatis, apice acutis et acuminatis, imo 5-nerviis, utrinque glabris et pallidis, nervis supra immersis, subtus prominulis, reticulatis; petiolo tenui limbo dimidio brevior; racemis axillaribus, simplicibus, petiolo paulo longioribus, imo foliolis minimis petiolatis donatis; floribus parvis viridulis.—In Australia centrali, *v. s. in herb. Hook.*, Plains of Promise (Dr. Moore).

This is a slender climbing plant, with internodes of 1– $1\frac{1}{2}$  inch; its leaves, from the basal lobes to the apex, 24–33 lines long, or from the basal sinus 19–25 lines long, 26 lines broad, with a petiole 10–12 lines long. The ♂ raceme is 18 lines long, pedicels 1 line long, with petiolated bracts at base 2 lines long; the three inner sepals are ovate, 1 line long, the membranaceous obovate petals  $\frac{1}{2}$  line long; its drupes are ovate, 3 lines long.

[To be continued.]

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XXXIV.—*New Observations on the Existence of Man in Central France at a period when that Country was inhabited by the Reindeer and other Animals which are now extinct there.* By MM. LARTET and CHRISTY, in a Letter from M. LARTET to Prof. Milne-Edwards; communicated by him to the Academy of Sciences in Paris\*.

IN support of the remarks made by you, at one of the recent meetings of the Academy, with regard to the figures of animals engraved on bones found in the cavern of Bruniquel, I have, in my own name and that of Mr. H. Christy, F.G.S., to inform you of several other facts of the same nature. We shall, however, limit ourselves for the present to mentioning the discoveries made by us, during the last five months of the year 1863, in that part of the old province of Périgord which now forms the arron-

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dissement of Sarlat. One of the grottos of this region (that of Les Eyzies, in the commune of Tayac) has presented us, in a breccia covering the soil in the form of a continuous floor, with an aggregation of broken bones, ashes, fragments of charcoal, chips and flakes of flint worked in different modes, but always in definite and frequently repeated forms, associated with other utensils and weapons manufactured of the bones or horns of the Reindeer. The whole of these things must have been fixed and consolidated into a breccia in the original state of the deposit, and before any re-arrangement, as series of several vertebræ of the Reindeer, and some assemblages of articulations consisting of several pieces, occur precisely in their anatomical connexion; the long bones with medullary cavities only have been detached, and split or broken in a uniform manner—that is to say, evidently with the object of extracting the marrow from them. What we now advance may, moreover, be proved by any competent observer, as we have taken care to have this breccia extracted in large slabs; and, after depositing the finest specimens in the museum at Périgueux and in the collection of the Jardin des Plantes at Paris, we have sent to various museums in France and elsewhere blocks of sufficient size to allow the verification of the observations of which we here give the details.

This grotto of Les Eyzies, the mouth of which is situated thirty-five metres above the level of the nearest watercourse, the Beune, also contained many pebbles and fragments of rocks foreign to the basin of that little river, and which must have been introduced there by man. Some of these rather large pebbles, chiefly those of granite, are flattened on one side, rounded in their outline, and hollowed above by a cavity of greater or less depth, which bears traces of repeated friction.

In the grotto there were also numerous fragments of a schistose rock, of considerable hardness; and upon two slabs of this rock we have been able to discern partial representations of animal forms engraved in profile. These are, we presume, the first examples observed of engraving on stone, at this ancient phase of the human period, when the Reindeer still inhabited what are now the temperate regions of Europe\*.

\* Figures of animals, dating from this same epoch, were reproduced by one of us in 1861 (*Ann. Sc. Nat. sér. 4, Zool. tom. xv. pl. 13*); but one of these figures, readily recognizable as the head of a bear, is engraved upon the horn of a deer. The other also is engraved upon the bone of a Ruminant: it represents two complete animals, which have been thought to resemble the Reindeer. The latter specimen, which was obtained from the grotto of Chaffaut, in the commune of Savigné (Vienne), has been deposited in the Cluny Museum by M. Mérimay, in the name of M. Joli Le Terme, architect at Saumur. It is accompanied by worked flints and reindeer-bones from the same locality.

Upon one of these slabs, which has reached us in an incomplete state in consequence of an ancient fracture, we can distinguish the fore quarters of a probably herbivorous quadruped, of which the head must have been armed with horns, as far as can be judged by the uncertain lines, which enter but slightly into this rather hard rock. In the other slab we recognize more readily a head, with the nostrils clearly marked, and the mouth half open, but which has its profile-lines interrupted in the frontal region by a sort of obliteration resulting from an apparently artificial friction posterior to the preparation of the engraving. A little in front upon the same slab there is the design of a large antler, which, if it really belongs to this head, would lead us, as you were the first to suggest, to refer it to the Elk.

Besides the ossiferous deposits of the interior of caves, which are so numerous in the Périgord district, we may also investigate there the analogous accumulations of organic débris which rest against the great escarpments of the cretaceous rocks in that region, and are sometimes sheltered merely by more or less overhanging projections of the rock. These exterior deposits likewise abound in worked flints and in fractured bones of animals (horse, ox, ibex, chamois, reindeer, birds, fishes, &c.), which have evidently served as food for the indigenous populations at this ancient period of the age of stone. The remains of the common stag are very rare, as are also those of the wild boar and the hare. We have found some isolated teeth of the gigantic Irish deer (*Megaceros hibernicus*), and some detached plates of the molars of the Mammoth (*E. primigenius*), exactly as we observed them in the hearth of the funeral feasts of the ancient burying-place of Aurignac, without being able to explain for what useful purpose these dentary laminæ were preserved thus isolated\*.

It is likewise in these exterior stations that we have collected the finest worked flints, particularly at that of Laugerie-Haute, where there seems to have been established a manufactory of the fine lance-heads worked with little chips upon the two faces, and with the margins slightly undulated. But we have probably found only the refuse of this manufactory, as very few specimens were entire amongst more than a hundred fragments which we obtained.

\* This reminds us that, in the grotto of Les Eyzies, we have found a part of the cortical portion of an elephant's tusk bearing traces of human work. We also collected there a metacarpal bone of the small digit of a young *Felis* of great size (*Felis spelæa?*), on which are seen small cuts and numerous scratches, produced by a cutting-tool, exactly like those which are observed upon the bones of reindeer or horses which have been eaten by men.

At Laugerie-Basse, about a third of a mile lower down, but still upon the banks of the Vezère, there was probably another factory of weapons and tools in reindeer-horns, if we may judge from the enormous quantity of the remains of horns of this animal accumulated there, nearly all of which bear traces of sawing, by means of which the pieces intended to be worked up were detached. It is there especially that we have procured, besides arrows and barbed harpoons (such as occur in nearly all the stations of this age), that great variety of utensils, some of which are adorned with elegant sculptures, the workmanship of which is truly astonishing when we consider the means of execution which could be possessed by these people, who were ignorant of the use of metals. Amongst them are some needles of reindeer's horn, finely pointed at one extremity, and pierced at the other with a hole or eye for the reception of a thread of some kind.

There are also some tools furnished at their extremity with obtuse notches, which would lead one to suspect that they were employed in the manufacture of nets. Teeth of various animals (wolf, ox), perforated at the root, must have served as ornaments, as also some other objects fashioned like ear-drops, sometimes of the ivory-like part of the ear-bones of the horse and ox.

Another object, previously found by one of us at the burying-place of Aurignac, and upon which he thought it as well to say nothing (distrusting the value of an observation still unique), has occurred both at Laugerie and in the grotto of Les Eyzies. It is a first phalanx, which is hollow in certain ruminants, and which is here pierced artificially beneath, a little in front of its metatarsal or metacarpal articulation. By placing the lower lip in the posterior articular cavity, and blowing into the hole, a sharp sound, like that given by a key-pipe of moderate size, is produced. This was, no doubt, a call-whistle, in common use amongst these tribes of hunters; for we have now four specimens, of which three are made of phalanges of the reindeer, and the fourth of a phalanx of the chamois.

At Laugerie-Basse, also, thanks to the intelligent supervision and minute precautions of M. A. Laganne, who had the management of our diggings, we have obtained portions of reindeer-horn which, notwithstanding the alteration that they have undergone by age, still retain very distinct representations of animal forms. Some of them are simply engraved in outline upon the palmature or terminal expansion of the frontal antlers of the reindeer; others are regularly sculptured, either in bas-relief or even in complete relief, upon portions of the horn of the same animal prepared for this purpose.

One of these palmations, of which an ancient fracture has caused the loss of a portion of the design, still presents us with

the exact outline, traced with a firm hand, of the hind-quarters of a large herbivorous animal. The slenderness of the tail, the small flexure of the knees, and especially the very forward position of the indication of the male sex, show that this is not a horse: we rather recognize in it a bovine form; and the sudden elevation of the dorsal line towards the withers would appear to lead us to the Aurochs. Unfortunately, the interruption of the design by the fracture of the specimen comes exactly at the point where the tufted mane, characteristic of the subgenus *Bison*, ought to commence.

In a second and more widely dilated palm, we find another evidently bovine form, judging from the knees and the small hoofs placed behind the cloven hoof. In this, the thicker tail, the more horizontal direction of the line of the back, and the presence of a smooth pendant dewlap between the anterior legs indicate a tendency towards the true ox (*Bos primigenius* ?); but a fracture has caused the loss of the region of the head to which the horns were attached; and the artist, in order to utilize the divisions of the palmature, has given the animal a distorted attitude, which injures the general effect of the design.

A third palmature, in which the engraved design has been preserved nearly entire, exhibits an animal of which the head is armed with two horns rising at first vertically and then bending back towards their point; behind these horns we see a less distinct indication of the ears, and beneath the chin that of a tuft of hair or beard—peculiarities which would lead us to regard it as a female Ibex, if they were not contradicted by the peculiar form of the face and by a swelling behind the ears. In this figure, moreover, the designer, with no apparent necessity for so doing, has bent up the hinder limbs beneath the belly of the animal in such a manner that the distinctly cloven hoofs touch the abdomen.

Among the sculptured pieces obtained from this same locality of Laugerie-Basse, we shall mention a rounded staff made of the stem of a reindeer-horn, and terminated at one end in a lance-point with a recurrent lateral hook. Was this a tool, a weapon, or a sign of authority? We cannot tell. Immediately above the hook, we see sculptured in half-relief upon three of its faces a horse's head, with the ears laid down, and rather long for the species, although not sufficiently so to lead one to attribute this figure to the ass. In front, and still upon the continuity of the staff, there is a second head, with a slender muzzle, and armed with branching horns. The basilar antlers are sculptured in front upon the horizontal prolongation of the staff, whilst the main stem and the palmature are thrown backwards: the slender form of the head, which shows no indication of a muffle, the

apparent dilatation of one of the basilar antlers, and the whole physiognomy of this figure would lead us to refer it rather to the reindeer than to the common stag. In front of the muzzle of this head there is another figure, simply engraved in outline, which may be easily taken for a form of fish.

There is another excellent specimen in which the art-sentiment is especially revealed by the clever manner in which the artist has been led to bend animal forms, without too much violence, to suit the necessities of a useful purpose. It is a poignard or short sword of reindeer-horn, of which the entire handle is formed by the body of an animal: the hind legs are laid in the direction of the blade; the fore legs are bent back, without effort, beneath the belly; the head, which has its muzzle elevated, forms with the back and the crupper a concavity designed to facilitate the grasping of this weapon by a hand which must have been much smaller than those of our European races. The head is armed with branched horns, which are closely applied to the sides of the neck without in any way hindering prehension; but the basilar antlers have necessarily been suppressed. The ear is smaller than that of the stag, and is also, in its position, more in agreement with that of the reindeer; lastly, the artist has left beneath the neck a projection, in the form of a thin plate notched at its edge, which sufficiently resembles the tuft of hair often found at this point in the male Reindeer. It is to be regretted that this specimen has reached us in the condition of a mere sketch, as may be judged from the unfinished workmanship of the blade, and from certain details of the sculpture being scarcely indicated.

If it were necessary to add fresh evidence to that already furnished in proof of the contemporaneity of man and the reindeer in those regions which have become the southern and central France of the present day, we might mention numerous horns of that animal at the base of which may be distinguished cuts made in detaching the skin from them. We should also call attention to other transverse cuts which are frequently observed at the bottom of the cannon-bones of our reindeer of the caves, produced during the cutting of the tendons, performed (as among the Esquimaux of the present day) with the intention of splitting them up and dividing them into threads which serve for sewing together the skins of animals and also for the formation of cords of great strength.

Lastly, we can also show a lumbar vertebra of the Reindeer pierced from side to side by a flint weapon, which has remained fixed in the bone, where it is further retained by a calcareous incrustation.

As an archæological fact characteristic of the period of the

Reindeer in France, we shall only mention that, out of seventeen stations where we have ascertained the presence of that animal in a state of subjection to the action of man, there is not one in which we have observed traces of polishing upon the stone weapons; nevertheless the worked flints have been collected by thousands, in every variety of type, and passing through all degrees of perfection of workmanship, from the roughly sketched form of the *haches* from the diluvium of Abbeville and Saint-Acheul, up to the lance-heads with numerous facets and with elegantly undulated margins of the best time of the stone age in Denmark.

As to the epoch when the Reindeer ceased to inhabit what is now temperate Europe, we have no positive historical or chronological data. The Reindeer was never seen or clearly described by any author of antiquity. Cæsar speaks of it only from hearsay, and as an animal still existing somewhere in a forest, of which the extreme limits were not reached even after a march of sixty days. We have not recognized the Reindeer among the animals figured upon the ancient coins of Gaul. Its bones have not been found in the dolmens (tumuli) and other burying-places regarded as Celtic, in which the remains of wild and domestic animals are frequently associated, and in which we have even twice observed bones of the beaver in the vicinity of Paris. The Reindeer has not yet, so far as we know, been found in the French turbaries; nor have MM. Garrigou and Filhol indicated its presence in certain caverns of the Ariège, which they have justly assimilated, from their zoological characters and also from the presence of instruments of polished stones, with the most ancient lacustrine habitations of Switzerland. We know that the Reindeer is still wanting to the fauna of these lacustrine pile-works; and yet we have been able to examine its remains, derived from a neighbouring cave (that of Mont-Salève), in which the association of simply worked flints and of mammals belonging to the same period occurs under the same conditions as in our grottos of Périgord.

Thus, whether the disappearance of the Reindeer from temperate Europe be the result of a regional extinction of this species, or of its expulsion by the progressive development of human societies, or of its gradual and spontaneous retirement in consequence of changes in climatic conditions, it is not the less probable that this disappearance took place at a phase of prehistoric time anterior to the introduction of the domestic races and to the use of metals in western Europe.